

Ejercicio 31 seccion1.8 grossman2Ed.

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Demuestre que la matriz no es invertible encontrando un vector $\mathbf{x}$ distinto de cero tal que $Ax=0$.

$$A = \begin{pmatrix} 2 & -1 \\ -4 & 2 \end{pmatrix}$$

Dan:

- matriz A
- $Ax=0$

Piden:

- encontrar un vector x tal que la matriz se haga cero.

Solucion:

$$\begin{pmatrix} 2 & -1 & 0 \\ -4 & 2 & 0 \end{pmatrix}$$

```
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| Sage Version 3.4, Release Date: 2009-03-11 |  
| Type notebook() for the GUI, and license() for information. |  
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Sage Version 3.4, Release Date: 2009-03-11
```

```
sage] A=matrix(QQ,[[2,-1,0],[-4,2,0]])
```

```
sage] A
```

$$\begin{pmatrix} 2 & -1 & 0 \\ -4 & 2 & 0 \end{pmatrix}$$

```
sage] A.echelon_form()
```

$$\begin{pmatrix} 1 & -\frac{1}{2} & 0 \\ 0 & 0 & 0 \end{pmatrix}$$

```
sage]
```

si $x = (\frac{1}{2}x)$ entonces $Ax=0$ luego $(1,2)$ es un vector solucion.

```
sage] v=vector([1,2])
```

```
sage] v
```

$$(1, 2)$$

```
sage] A=matrix(QQ,[[2,-1],[-4,2]])
```

```
sage] A*v
```

$$(0, 0)$$

```
sage]
```

la solucion final es 0.